

A Low-Cost, Multi-Functional Sensor Network System for Intelligent Vehicle Health Assessments, Phase I

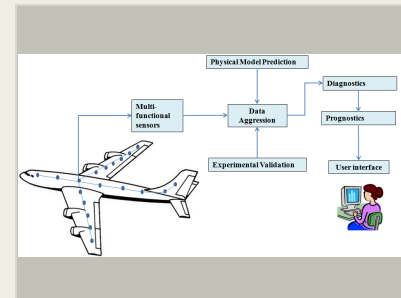
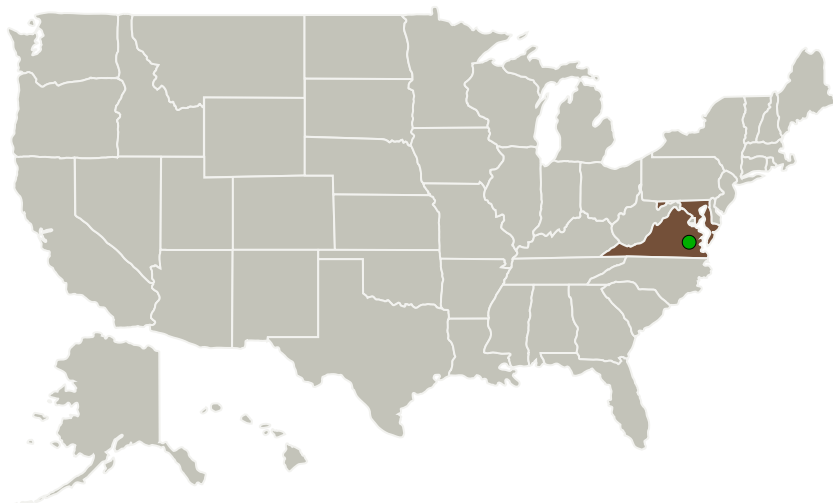
Completed Technology Project (2016 - 2016)



Project Introduction

NASA is seeking innovative, multifunctional and lightweight approach to integrate long-duration structural health monitoring (SHM) capabilities for space habitat long-duration mission concepts. The enabling sensing technology and integration approach should not compromise the load-carrying capability or other structural design requirement. Sensing capabilities by fusing multiple sensors to predict and locate critical damage areas and probable failure zones are highly demanded. To address this critical need, X-wave Innovations, Inc. (XII) proposes to develop a low-cost, multi-functional sensor network system (MFSNS) for intelligent monitoring of critical aero- and space vehicle structures. For the Phase I program, we will prototype a MFSNS system and demonstrate the feasibility of the proposed technique for precursor/damage detection and long-duration structural health monitoring. For the Phase II program, XII will focus on refining the prototype system design and development with improved hardware and software. For the Phase III program, XII will focus on optimizing the MFSNS performance and packing the MFSNS technology into a turnkey commercially-available system.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
X-wave Innovations	Lead Organization	Industry Women-Owned Small Business (WOSB)	Gaithersburg, Maryland
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

X-wave Innovations

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Carlos Rentel

Project Transitions

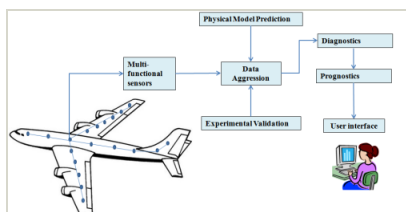
▶ **June 2016:** Project Start

✓ **December 2016:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139584>)

Images



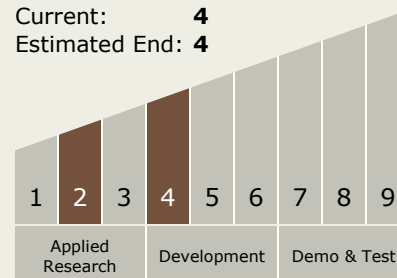
Briefing Chart Image

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(<https://techport.nasa.gov/image/132193>)

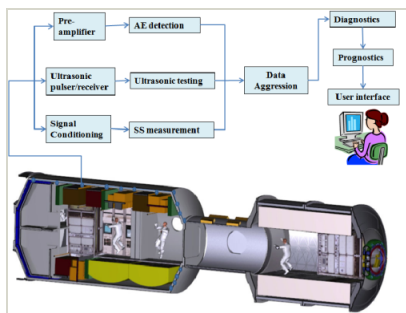
Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Final Summary Chart Image

A Low-Cost, Multi-Functional
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Assessments, Phase I Project
Image

(<https://techport.nasa.gov/image/136298>)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.2 Structures
 - └ TX12.2.3 Reliability and Sustainment

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System